



SEQUENCE LISTING

<110> Bennett, C. Frank
Mirabelli, Christopher K.

<120> OLIGONUCLEOTIDE MODULATION OF CELL ADHESION

<130> ISPH-0612

<140> US 09/982,262
<141> 2001-10-18

<150> US 08/007,997
<151> 1993-01-21

<150> US 07/969,151
<151> 1993-02-10

<150> US 08/063,167
<151> 1993-05-17

<150> US 08/440,740
<151> 1995-05-12

<150> US 09/128,496
<151> 1998-08-03

<150> US 09/659,288
<151> 2000-09-12

<160> 92

<170> PatentIn version 3.1

<210> 1
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 1
tgggagccat agcgaggc
18

<210> 2
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 2
gaggagctca gcgtcgactg
20

<210> 3
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 3
gacactcaat aaatagctgg t
21

<210> 4
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 4
gaggctgagg tgggagga
18

<210> 5
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 5
cgatgggcag tgggaaag
18

<210> 6
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 6
gggcgcgtga tccttatagc
20

<210> 7
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 7
catagcgagg ctgaggttgc
20

<210> 8
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 8
cgggggctgc tgggagccat
20

<210> 9
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 9
agagccccga gcaggaccag
20

<210> 10
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 10
tgcccatcag ggcagtttga
20

<210> 11
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 11
ggtcacactg actgaggcct
20

<210> 12
<211> 20

<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 12
ctcgcgggtg acctcccctt
20

<210> 13
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 13
tcagggaggc gtggcttgtg
20

<210> 14
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 14
cctgtcccgg gataggttca
20

<210> 15
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 15
ccccaccac ttcccctctc
20

<210> 16
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 16

ttgagaaagc tttattaact

5
20

<210> 17
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 17
agccatagcg aggc
14

<210> 18
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 18
ccatagcgag gc
12

<210> 19
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 19
atagcgaggc
10

<210> 20
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 20
tgggagccat agcgag
16

<210> 21
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 21
ggagccatag cgaggc
16

<210> 22
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 22
gcccaagctg gcatccgtca
20

<210> 23
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 23
tctgtaagtc tgtgggcctc
20

<210> 24
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 24
agtcttgctc cttcctcttg
20

<210> 25
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 25
ctcatcaggc tagactttaa
20

<210> 26
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 26
tgtcctcatg gtggggctat
20

<210> 27
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 27
tctgagtagc agaggagctc ga
22

<210> 28
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 28
caatcatgac ttcaagagtt ct
22

<210> 29
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 29
accacactgg tatttcacac
20

<210> 30
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 30
gtatggaaga ttataatata t
21

<210> 31
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 31
cacaatcctt aagaactctt t
21

<210> 32
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 32
acctctgctg ttctgacct
20

<210> 33
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 33
ctgctgcctc tgtctcaggt
20

<210> 34
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 34
ggtatttgac acagc
15

<210> 35
<211> 21
<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense oligonucleotide

<400> 35

aatcatgact tcaagagttc t

21

<210> 36

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense oligonucleotide

<400> 36

tgaagcaatc atgacttcaa g

21

<210> 37

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense oligonucleotide

<400> 37

tataggagtt ttgatgtgaa

20

<210> 38

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense oligonucleotide

<400> 38

acaatgaggg ggtaatctac a

21

<210> 39

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense oligonucleotide

<400> 39

gacaatatac aaaccttcca t

21

<210> 40
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 40
ccaggcattt taagttgctg t
21

<210> 41
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 41
cctgaagcca gtgaggcccg
20

<210> 42
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 42
gatgagaaaa tagtggaacc a
21

<210> 43
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 43
ctgagcaaga tatctagat
19

<210> 44
<211> 19
<212> DNA
<213> Artificial Sequence

<220>

<223> Antisense oligonucleotide

<400> 44
ctacactttt gatttctgt
19

<210> 45
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 45
ttgaacatat caagcattag ct
22

<210> 46
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 46
tttacatatg taaaaattat gt
22

<210> 47
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 47
aattatcact ttactataca aa
22

<210> 48
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 48
agggctgacc aagacggttg t
21

<210> 49

<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 49
ccatcttccc aggcatttta
20

<210> 50
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 50
aaccagtgcc tccctttgct
20

<210> 51
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 51
aaccagtgcc tccctttgct
20

<210> 52
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 52
gaagtcagcc aagaacagct
20

<210> 53
<211> 20
<212> DNA
<213> Artificial Sequence

<400> 53
acaggatctc tcagggtgggt
20

<210> 54
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 54
ccaaagtgag agctgagaga
20

<210> 55
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 55
ctgattcaag gctttggcag
20

<210> 56
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 56
ttccccagat gcacctgttt
20

<210> 57
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 57
gggccagaga cccgaggaga
20

<210> 58
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 58
acgttttgcc tcatggaagt
20

<210> 59
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 59
ggaatgcaaa gcacatccat
20

<210> 60
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 60
cgatgcagat accgcggagt
20

<210> 61
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 61
gcctgggagg gtattcagct
20

<210> 62
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 62
cctgtgtgtg cctgggaggg
20

<210> 63
<211> 20

<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 63
ggcattttaa gttgctgtcg
20

<210> 64
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 64
cagcctgcct tactgtgggc
20

<210> 65
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 65
cttgaacaat taattccacc t
21

<210> 66
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 66
ttaccattga cataaagtgt t
21

<210> 67
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 67

16
20

ctgtgtctcc tgtctccgct

<210> 68
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 68
gtctttgttg ttttctcttc c
21

<210> 69
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 69
tgaacatatc aagcattagc
20

<210> 70
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 70
gcaatcttgc tatggcataa
20

<210> 71
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 71
cccggcatct ttacaaaacc
20

<210> 72
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 72
aacatctccg taccatgcc
20

<210> 73
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 73
tcactgctgc ctctgtctca gg
22

<210> 74
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 74
tgattctttt gaacttaaaa gga
23

<210> 75
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 75
ttaaaggatg taagaaggct
20

<210> 76
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 76
cataagcaca tttattgtc
19

<210> 77
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 77
ttttgggaag cagttgttca
20

<210> 78
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 78
aactgtgaag caatcatgac t
21

<210> 79
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 79
ccttgagtgg tgcattcaac ct
22

<210> 80
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 80
aatgcttgct cacacaggca tt
22

<210> 81
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 81
gcctcgctat ggctccca
18

<210> 82
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 82
catggcgcg ggcgcggg
18

<210> 83
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 83
tgcattcccc aggcaccat
20

<210> 84
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 84
tctgagtagc agaggagctc
20

<210> 85
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Antisense oligonucleotide

<400> 85
tatgtctccc ccaccattc
20

<210> 86
<211> 20
<212> DNA

<213> Artificial Sequence

<220>

<223> Antisense oligonucleotide

<400> 86

agggccactg ctcgtccaca

20

<210> 87

<211> 3017

<212> DNA

<213> Homo sapiens

<400> 87

gctataagga tcacgcgccc cagtcgacgc tgagctcctc tgctactcag agttgcaacc
60

tcagcctcgc tatggctccc agcagcccc ggcccgcgct gccgcactc ctggctcctgc
120

tcggggctct gttcccagga cctggcaatg cccagacatc tgtgtcccc tcaaaagtca
180

tcctgccccg gggaggctcc gtgctggtga catgcagcac ctctgtgac cagcccaagt
240

tggtgggcat agagacccc ttgcctaaaa aggagttgct cctgcctggg aacaaccgga
300

agggtgatga actgagcaat gtgcaagaag atagccaacc aatgtgctat tcaaactgcc
360

ctgatgggca gtcaacagct aaaaccttcc tcaccgtgta ctggactcca gaacgggtgg
420

aactggcacc cctcccctct tggcagccag tgggcaagaa ccttacccta cgctgccagg
480

tggagggtgg ggcaccccgg gccaacctca ccgtggtgct gctccgtggg gagaaggagc
540

tgaaacggga gccagctgtg ggggagccc ctgagggtcac gaccacggtg ctggtgagga
600

gagatcacca tggagccaat ttctcgtgcc gactgaact ggacctgcgg cccaagggc
660

tggagctggt tgagaacacc tcggccccct accagctcca gacctttgtc ctgccagcga
720

ctccccaca acttgtcagc ccccggttcc tagagggtgga cacgcagggg accgtggtct
780

gttccctgga cgggctgttc ccagtctcgg aggcccaggt ccacctggca ctgggggacc
840

agaggttgaa cccacagtc acctatggca acgactcctt ctgggccaag gcctcagtca
900

gtgtgaccgc agaggacgag ggcacccagc ggctgacgtg tgcagtaata ctggggaacc
960

agagccagga gacactgcag acagtgacca tctacagctt tccggcgccc aacgtgattc
1020

tgacgaagcc agaggtctca gaagggaccg aggtgacagt gaagtgtgag gccacccta
1080

gagccaaggt gacgctgaat ggggttccag cccagccact gggcccgagg gccagctcc
1140

tgctgaaggc cccccagag gacaacgggc gcagcttctc ctgctctgca accctggagg
1200

tggccggcca gcttatacac aagaaccaga cccgggagct tcgtgtcctg tatggcccc
1260

gactggacga gagggattgt ccgggaaact ggacgtggcc agaaaattcc cagcagactc
1320

caatgtgcca ggcttggggg aaccattgc ccgagctcaa gtgtctaaag gatggcactt
1380

tcccactgcc catcggggaa tcagtgactg tcaactcgaga tcttgagggc acctacctt
1440

gtcgggccag gagcactcaa ggggaggtca cccgcgaggt gaccgtgaat gtgctctccc
1500

cccgtatga gattgtcatc atcactgtgg tagcagccgc agtcataatg ggcactgcag
1560

gcctcagcac gtacctctat aaccgccagc ggaagatcaa gaaatacaga ctacaacagg
1620

cccaaaaagg gacccccatg aaaccgaaca cacaagccac gcctccctga acctatccc
1680

ggacagggcc tcttctcgg ctttccata ttggtggcag tgggtgccaca ctgaacagag
1740

tggaagacat atgccatgca gctacaccta ccggccctgg gacgccggag gacagggcat
1800

tgctctcagt cagatacaac agcatttggg gccatggtac ctgcacacct aaaacactag
1860

gccacgcac tgatctgtag tcacatgact aagccaagag gaaggagcaa gactcaagac
1920

atgattgatg gatgttaaag tctagcctga tgagagggga agtgggtggg gagacatagc
1980

cccaccatga ggacatacaa ctgggaaata ctgaaacttg ctgcctattg ggtatgctga
2040

ggccacaga cttacagaag aagtggccct ccatagacat gtgtagcatc aaaacacaaa
2100

ggccacact tctgacgga tgccagcttg ggcactgctg tctactgacc ccaacccttg
2160

atgatatgta tttattcatt tgttatttta ccagctattt attgagtgtc ttttatgtag
2220

gctaaatgaa cataggtctc tggcctcacg gagctcccag tccatgtcac attcaaggtc
2280

accaggtaca gttgtacagg ttgtacactg caggagagtg cctggcaaaa agatcaaagt
2340

gggctgggac ttctcattgg ccaacctgcc tttcccaga aggagtgatt tttctatcgg
2400

cacaaaagca ctatatggac tggtaatggt tcacagggtc agagattacc cagtgaggcc
2460

ttattctctc cttcccccca aaactgacac ctttgtttagc cacctcccca cccacataca
2520

tttctgccag tggtacaatg acactcagcg gtcattgtctg gacatgagtg cccagggagt
2580

atgcccagc tatgccttgt cctcttgtcc tgtttgcatt tcaactggag cttgcactat
2640

tgcagctcca gtttcttgca gtgatcaggg tcctgcaagc agtggggaag ggggccaagg
2700

tattggagga ctccctcca gctttggaag ggtcatccgc gtgtgtgtgt gtgtgtatgt
2760

gtagacaagc tctcgctctg tcaccaggc tggagtgcag tgggtgcaatc atggttcact
2820

gcagtcttga ccttttgggc tcaagtgatc ctccacctc agcctcctga gtagctggga
2880

ccataggctc acaacaccac acctggcaaa ttgattttt tttttttttt tcagagacgg
2940

ggtctcgcaa cattgccag acttccttg tgtagttaa taaagcttc tcaactgcca
3000

aaaaaaaaa aaaaaaa
3017

<210> 88
<211> 532
<212> PRT
<213> Homo sapiens

<400> 88

Met	Ala	Pro	Ser	Ser	Pro	Arg	Pro	Ala	Leu	Pro	Ala	Leu	Leu	Val	Leu
1				5					10					15	

Leu Gly Ala Leu Phe Pro Gly Pro Gly Asn Ala Gln Thr Ser Val Ser
 20 25 30

Pro Ser Lys Val Ile Leu Pro Arg Gly Gly Ser Val Leu Val Thr Cys
 35 40 45

Ser Thr Ser Cys Asp Gln Pro Lys Leu Leu Gly Ile Glu Thr Pro Leu
 50 55 60

Pro Lys Lys Glu Leu Leu Leu Pro Gly Asn Asn Arg Lys Val Tyr Glu
 65 70 75 80

Leu Ser Asn Val Gln Glu Asp Ser Gln Pro Met Cys Tyr Ser Asn Cys
 85 90 95

Pro Asp Gly Gln Ser Thr Ala Lys Thr Phe Leu Thr Val Tyr Trp Thr
 100 105 110

Pro Glu Arg Val Glu Leu Ala Pro Leu Pro Ser Trp Gln Pro Val Gly
 115 120 125

Lys Asn Leu Thr Leu Arg Cys Gln Val Glu Gly Gly Ala Pro Arg Ala
 130 135 140

Asn Leu Thr Val Val Leu Leu Arg Gly Glu Lys Glu Leu Lys Arg Glu
 145 150 155 160

Pro Ala Val Gly Glu Pro Ala Glu Val Thr Thr Thr Val Leu Val Arg
 165 170 175

Arg Asp His His Gly Ala Asn Phe Ser Cys Arg Thr Glu Leu Asp Leu
 180 185 190

Arg Pro Gln Gly Leu Glu Leu Phe Glu Asn Thr Ser Ala Pro Tyr Gln
 195 200 205

Leu Gln Thr Phe Val Leu Pro Ala Thr Pro Pro Gln Leu Val Ser Pro
 210 215 220

Arg Val Leu Glu Val Asp Thr Gln Gly Thr Val Val Cys Ser Leu Asp
 225 230 235 240

Gly Leu Phe Pro Val Ser Glu Ala Gln Val His Leu Ala Leu Gly Asp
 245 250 255

Gln Arg Leu Asn Pro Thr Val Thr Tyr Gly Asn Asp Ser Phe Ser Ala
 260 265 270

Lys Ala Ser Val Ser Val Thr Ala Glu Asp Glu Gly Thr Gln Arg Leu
 275 280 285

Thr Cys Ala Val Ile Leu Gly Asn Gln Ser Gln Glu Thr Leu Gln Thr
 290 295 300

Val Thr Ile Tyr Ser Phe Pro Ala Pro Asn Val Ile Leu Thr Lys Pro
 305 310 315 320

Glu Val Ser Glu Gly Thr Glu Val Thr Val Lys Cys Glu Ala His Pro
 325 330 335

Arg Ala Lys Val Thr Leu Asn Gly Val Pro Ala Gln Pro Leu Gly Pro
 340 345 350

Arg Ala Gln Leu Leu Leu Lys Ala Thr Pro Glu Asp Asn Gly Arg Ser
 355 360 365

Phe Ser Cys Ser Ala Thr Leu Glu Val Ala Gly Gln Leu Ile His Lys
 370 375 380

Asn Gln Thr Arg Glu Leu Arg Val Leu Tyr Gly Pro Arg Leu Asp Glu
 385 390 395 400

Arg Asp Cys Pro Gly Asn Trp Thr Trp Pro Glu Asn Ser Gln Gln Thr
 405 410 415

Pro Met Cys Gln Ala Trp Gly Asn Pro Leu Pro Glu Leu Lys Cys Leu
 420 425 430

Lys Asp Gly Thr Phe Pro Leu Pro Ile Gly Glu Ser Val Thr Val Thr
 435 440 445

Arg Asp Leu Glu Gly Thr Tyr Leu Cys Arg Ala Arg Ser Thr Gln Gly
 450 455 460

Glu Val Thr Arg Glu Val Thr Val Asn Val Leu Ser Pro Arg Tyr Glu
 465 470 475 480

Ile Val Ile Ile Thr Val Val Ala Ala Val Ile Met Gly Thr Ala
 485 490 495

Gly Leu Ser Thr Tyr Leu Tyr Asn Arg Gln Arg Lys Ile Lys Lys Tyr
500 505 510

Arg Leu Gln Gln Ala Gln Lys Gly Thr Pro Met Lys Pro Asn Thr Gln
515 520 525

Ala Thr Pro Pro
530

```
<210> 89
<211> 3858
<212> DNA
<213> Homo sapiens
```

```
<400> 89
ttcacatcaa aactcctata ctgacctgag acagaggcag cagtgatacc cacctgagag
60
```

atctctgtggt tgaacaactg cttcccaaaa cggaaagtat ttcaagccta aacctttggg
120

tgaaaaagaac tcttgaagtc atgattgctt cacagtttct ctcagctctc actttgggtgc
180

ttctcattaa agagagtgga gcttggtctt acaacacctc cacggaagct atgacttatg
240

atgaggccag tgcttattgt cagcaaaggt acacacacct ggttgcaatt caaaacaaag
300

aagagattga gtacctaaac tccatattga gctattcacc aagttattac tggattggaa
360

tcagaaaaagt caacaatgtg tgggtctggg taggaacca gaaacctctg acagaagaag
420

ccaagaactg ggctccaggt gaacccaaca ataggcaaaa agatgaggac tgcgtggaga
480

tctacatcaa gagagaaaaa gatgtgggca tgtggaatga tgagaggtgc agcaagaaga
540

agcttgcct atgctacaca gctgcctgta ccaatacatc ctgcagtggc cacgggtgaat
600

gtgtagagac catcaataat tacacttgca agtgtgaccc tggettcagt ggactcaagt
660

gtgagcaaat tgtgaactgt acagccctgg aatcccctga gcatggaagc ctggtttgca
720

gtcaccctact gggaaacttc agctacaatt cttcctgctc tatcagctgt gatagggggt
780

acctgccaaag cagcatggag accatgcagt gtatgtcctc tggagaatgg agtgctccta
840

ttccagcctg caatgtggtt gagtgtgatg ctgtgacaaa tccagccaat gggttcgtgg
900

aatgtttcca aaaccttgga agcttcccat ggaacacaac ctgtacattt gactgtgaag
960

aaggatttga actaatggga gccagagcc ttcagtgtac ctcatctggg aattgggaca
1020

acgagaagcc aacgtgtaaa gctgtgacat gcagggccgt ccgccagcct cagaatggct
1080

ctgtgaggtg cagccattcc cctgctggag agttcacctt caaatcatcc tgcaacttca
1140

cctgtgagga aggcttcatg ttgcaggac cagcccaggt tgaatgcacc actcaagggc
1200

agtggacaca gcaaatccca gtttgtgaag ctttccagtg cacagccttg tccaaccccg
1260

agcgaggcta catgaattgt cttcctagtg cttctggcag tttccgttat gggccagct
1320

gtgagttctc ctgtgagcag ggttttgtgt tgaagggatc caaaaggctc caatgtggcc
1380

ccacagggga gtgggacaac gagaagccca catgtgaagc tgtgagatgc gatgctgtcc
1440

accagccccc gaagggtttg gtgaggtgtg ctcattcccc tattggagaa ttcacctaca
1500

agtcctcttg tgccctcagc tgtgaggagg gatttgaatt atatggatca actcaacttg
1560

agtgcacatc tcagggacaa tggacagaag aggttccttc ctgccaagtg gtaaaatgtt
1620

caagcctggc agttccggga aagatcaaca tgagctgcag tggggagccc gtgtttggca
1680

ctgtgtgcaa gttcgctgtg cctgaaggat ggacgctcaa tggctctgca gctcggacat
1740

gtggagccac aggacactgg tctggcctgc tacctacctg tgaagctccc actgagtcca
1800

acattccctt ggtagctgga ctttctgctg ctggactctc cctcctgaca ttagcaccat
1860

ttctcctctg gcttcggaaa tgcttacgga aagcaaagaa atttgttcct gccagcagct
1920

gccaaagcct tgaatcagat ggaagctacc aaaagccttc ttacatcctt taagttcaaa
1980

agaatcagaa acaggtgcat ctgggggaact agagggatac actgaagtta acagagacag
2040

ataactctcc tcgggtctct ggcccttctt gcctactatg ccagatgcct ttatggctga
2100

aaccgcaaca cccatcacca cttcaataga tcaaagtcca gcaggcaagg acggccttca
2160

actgaaaaga ctcaagtgtc cctttcctac tctcaggatc aagaaagtgt tggctaataga
2220

agggaaagga tattttcttc caagcaaagg tgaagagacc aagactctga aatctcagaa
2280

ttccttttct aactctccct tgctcgctgt aaaatcttgg cacagaaaca caatattttg
2340

tggcttttct tcttttgccc ttcacagtgt ttcgacagct gattacacag ttgctgtcat
2400

aagaatgaat aataattatc cagagtttag aggaaaaaaa tgactaaaaa tattataact
2460

taaaaaaatg acagatgttg aatgccaca ggcaaatgca tggaggggtg ttaatggtgc
2520

aaatcctact gaatgctctg tgcgagggtt actatgcaca atttaatcac tttcatccct
2580

atgggattca gtgcttctta aagagttctt aaggattgtg atatttttac ttgcattgaa
2640

tatattataa tcttccatac ttcttcattc aatacaagtg tggtagggac ttaaaaaact
2700

tgtaaatgct gtcaactatg atatggtaaa agttacttat tctagattac cccctcattg
2760

tttattaaca aattatgtta catctgtttt aaatttatTTT caaaaaggga aactattgtc
2820

ccctagcaag gcatgatgtt aaccagaata aagtcttgag tgtttttact acagttgttt
2880

tttggaaaaca tggtagaatt ggagagtaaa aactgaatgg aaggtttgta tattgtcaga
2940

tattttttca gaaatatgtg gtttccacga tgaaaaactt ccatgaggcc aaacgttttg
3000

aactaataaa agcataaatg caaacacaca aaggtataat tttatgaatg tctttgttgg
3060

aaaagaatac agaaagatgg atgtgctttg cattcctaca aagatgtttg tcagatgtga
3120

tatgtaaaca taattcttgt atattatgga agatttttaa ttcacaatag aaactcacca
3180

tgtaaaaagag tcatctggta gatttttaac gaatgaagat gtctaatagt tattccctat
3240

ttgttttctt ctgtatgtta gggtgctctg gaagagagga atgcctgtgt gagcaagcat
3300

ttatgtttat ttataagcag atttaacaat tccaaaggaa tctccagttt tcagttgato
3360

actggcaatg aaaaattctc agtcagtaat tgccaaagct gctctagcct tgaggagtgt
3420

gagaatcaaa actctcctac acttccatta acttagcatg tgttgaaaaa aaaagtttca
3480

gagaagttct ggctgaacac tggcaacgac aaagccaaca gtcaaaacag agatgtgata
3540

aggatcagaa cagcagaggt tcttttaaag gggcagaaaa actctgggaa ataagagaga
3600

acaactactg tgatcaggct atgtatggaa tacagtgtta ttttctttga aattgtttaa
3660

gtgttgtaaa tatttatgta aactgcatta gaaattagct gtgtgaaata ccagtgtggt
3720

ttgtgtttga gttttattga gaattttaaa ttataactta aaatatttta taatttttaa
3780

agtatatatt tatttaagct tatgtcagac ctatttgaca taacactata aaggttgaca
3840

ataaatgtgc ttatgttt
3858

<210> 90
<211> 610
<212> PRT
<213> Homo sapiens

<400> 90

Met Ile Ala Ser Gln Phe Leu Ser Ala Leu Thr Leu Val Leu Leu Ile
1 5 10 15

Lys Glu Ser Gly Ala Trp Ser Tyr Asn Thr Ser Thr Glu Ala Met Thr
20 25 30

Tyr Asp Glu Ala Ser Ala Tyr Cys Gln Gln Arg Tyr Thr His Leu Val
35 40 45

Ala Ile Gln Asn Lys Glu Glu Ile Glu Tyr Leu Asn Ser Ile Leu Ser
50 55 60

Tyr Ser Pro Ser Tyr Tyr Trp Ile Gly Ile Arg Lys Val Asn Asn Val
65 70 75 80

Trp Val Trp Val Gly Thr Gln Lys Pro Leu Thr Glu Glu Ala Lys Asn
 85 90 95
 Trp Ala Pro Gly Glu Pro Asn Asn Arg Gln Lys Asp Glu Asp Cys Val
 100 105 110
 Glu Ile Tyr Ile Lys Arg Glu Lys Asp Val Gly Met Trp Asn Asp Glu
 115 120 125
 Arg Cys Ser Lys Lys Lys Leu Ala Leu Cys Tyr Thr Ala Ala Cys Thr
 130 135 140
 Asn Thr Ser Cys Ser Gly His Gly Glu Cys Val Glu Thr Ile Asn Asn
 145 150 155 160
 Tyr Thr Cys Lys Cys Asp Pro Gly Phe Ser Gly Leu Lys Cys Glu Gln
 165 170 175
 Ile Val Asn Cys Thr Ala Leu Glu Ser Pro Glu His Gly Ser Leu Val
 180 185 190
 Cys Ser His Pro Leu Gly Asn Phe Ser Tyr Asn Ser Ser Cys Ser Ile
 195 200 205
 Ser Cys Asp Arg Gly Tyr Leu Pro Ser Ser Met Glu Thr Met Gln Cys
 210 215 220
 Met Ser Ser Gly Glu Trp Ser Ala Pro Ile Pro Ala Cys Asn Val Val
 225 230 235 240
 Glu Cys Asp Ala Val Thr Asn Pro Ala Asn Gly Phe Val Glu Cys Phe
 245 250 255
 Gln Asn Pro Gly Ser Phe Pro Trp Asn Thr Thr Cys Thr Phe Asp Cys
 260 265 270
 Glu Glu Gly Phe Glu Leu Met Gly Ala Gln Ser Leu Gln Cys Thr Ser
 275 280 285
 Ser Gly Asn Trp Asp Asn Glu Lys Pro Thr Cys Lys Ala Val Thr Cys
 290 295 300
 Arg Ala Val Arg Gln Pro Gln Asn Gly Ser Val Arg Cys Ser His Ser
 305 310 315 320

Pro	Ala	Gly	Glu	Phe	Thr	Phe	Lys	Ser	Ser	Cys	Asn	Phe	Thr	Cys	Glu
				325					330					335	
Glu	Gly	Phe	Met	Leu	Gln	Gly	Pro	Ala	Gln	Val	Glu	Cys	Thr	Thr	Gln
			340					345					350		
Gly	Gln	Trp	Thr	Gln	Gln	Ile	Pro	Val	Cys	Glu	Ala	Phe	Gln	Cys	Thr
		355					360					365			
Ala	Leu	Ser	Asn	Pro	Glu	Arg	Gly	Tyr	Met	Asn	Cys	Leu	Pro	Ser	Ala
	370					375					380				
Ser	Gly	Ser	Phe	Arg	Tyr	Gly	Ser	Ser	Cys	Glu	Phe	Ser	Cys	Glu	Gln
385					390					395					400
Gly	Phe	Val	Leu	Lys	Gly	Ser	Lys	Arg	Leu	Gln	Cys	Gly	Pro	Thr	Gly
				405					410					415	
Glu	Trp	Asp	Asn	Glu	Lys	Pro	Thr	Cys	Glu	Ala	Val	Arg	Cys	Asp	Ala
			420					425					430		
Val	His	Gln	Pro	Pro	Lys	Gly	Leu	Val	Arg	Cys	Ala	His	Ser	Pro	Ile
		435					440					445			
Gly	Glu	Phe	Thr	Tyr	Lys	Ser	Ser	Cys	Ala	Phe	Ser	Cys	Glu	Glu	Gly
	450					455					460				
Phe	Glu	Leu	Tyr	Gly	Ser	Thr	Gln	Leu	Glu	Cys	Thr	Ser	Gln	Gly	Gln
465					470					475					480
Trp	Thr	Glu	Glu	Val	Pro	Ser	Cys	Gln	Val	Val	Lys	Cys	Ser	Ser	Leu
				485					490					495	
Ala	Val	Pro	Gly	Lys	Ile	Asn	Met	Ser	Cys	Ser	Gly	Glu	Pro	Val	Phe
			500					505					510		
Gly	Thr	Val	Cys	Lys	Phe	Ala	Cys	Pro	Glu	Gly	Trp	Thr	Leu	Asn	Gly
		515					520					525			
Ser	Ala	Ala	Arg	Thr	Cys	Gly	Ala	Thr	Gly	His	Trp	Ser	Gly	Leu	Leu
	530					535					540				
Pro	Thr	Cys	Glu	Ala	Pro	Thr	Glu	Ser	Asn	Ile	Pro	Leu	Val	Ala	Gly
545					550					555					560

Ser Cys Gln Ser Leu Glu Ser Asp Gly Ser Tyr Gln Lys Pro Ser Tyr
595 600 605

Ile Leu
610

```
<210> 91
<211> 2813
<212> DNA
<213> Homo sapiens
```

```
<400> 91
cgggcctcac tggcttcagg agctgaatac cctcccaggc acacacaggt gggacacaaa
60
```

taaggggtttt ggaaccacta ttttctcatc acgacagcaa cttaaaatgc ctgggaagat
120

gtgcgtgata cttggagcct caaatatact ttggataatg tttgcagctt ctcaagcttt
180

taaaatcgag accacccag aatctagata tcttgctcag attggtgact cgtctcatt
240

gacttgcagc accacaggct gtgagtcgcc atttttctct tggagaaccc agatagatag
300

tccactgaat gggaaggtga cgaatgaggg gaccacatct acgctgacaa tgaatcctgt
360

tagtttttggg aacgaacact cttacctgtg cacagcaact tgtgaatcta ggaaatttgg
420

aaaaggaatc caggtggaga tctactcttt tcctaaggat ccagagattc atttgagtgg
480

ccctctggag gctgggaagc cgatcacagt caagtgttca gttgctgatg tataccatt
540

tgacaggctg gagatagact tactgaaagg agatcatctc atgaagagtc aggaatttct
600

ggaggatgca gacaggaagt ccctggaaac caagagtttg gaagtaacct ttactcctgt
660

cattgaggat attggaaaag ttcttgtttg ccgagctaaa ttacacattg atgaaatgga
720

ttctgtgccc acagtaaggc aggctgtaaa agaattgcaa gtctacatat cacccaagaa
780

tacagttatt tctgtgaatc catccacaaa gctgcaagaa ggtggctctg tgaccatgac
840

ctgttccagc gagggctctac cagctccaga gattttcttg agtaagaaat tagataatgg
900

gaatctacag cacctttctg gaaatgcaac tctcacctta attgctatga ggatggaaga
960

ttctggaatt tatgtgtgtg aaggagttaa tttgattggg aaaaacagaa aagaggtgga
1020

attaattggt caagcattcc ctagagatcc agaaatcgag atgagtgggt gcctcgtgaa
1080

tgggagctct gtcactgtaa gctgcaaggt tcctagcgtg tacccttg accggctgga
1140

gattgaatta ctttaagggg agactattct ggagaatata gagtttttg aggatacga
1200

tatgaaatct ctagagaaca aaagtttga aatgaccttc atccctacca ttgaagatac
1260

tggaaaagct cttgtttgtc aggctaagtt acatattgat gacatggaat tcgaacccaa
1320

acaaaggcag agtacgcaa cactttatgt caatgttgcc cccagagata caaccgtctt
1380

ggtcagccct tcttccatcc tggaggaagg cagttctgtg aatatgacat gcttgagcca
1440

gggctttcct gctccgaaaa tctgtggag caggcagctc cctaacgggg agctacagcc
1500

tctttctgag aatgcaactc tcaccttaat ttctacaaaa atggaagatt ctggggttta
1560

tttatgtgaa ggaattaacc aggctggaag aagcagaaag gaagtggaat taattatcca
1620

agttactcca aaagacataa aacttacagc ttttccttct gagagtgtca aagaaggaga
1680

cactgtcatc atctcttgta catgtggaaa tgttccagaa acatggataa tctgaagaa
1740

aaaagcggag acaggagaca cagtactaaa atctatagat ggcgcctata ccatccgaaa
1800

ggcccagttg aaggatgcgg gagtatatga atgtgaatct aaaaacaaag ttggctcaca
1860

attaagaagt ttaacacttg atgttcaagg aagagaaaac aacaaagact atttttctcc
1920

tgagcttctc gtgctctatt ttgcatcctc ctttaataata cctgccattg gaatgataat
1980

ttactttgca agaaaagcca acatgaaggg gtcatatagt cttgtagaag cacagaaatc
2040

aaaagtgtag ctaatgcttg atatgttcaa ctggagacac tatttatctg tgcaaatcct
2100

tgatactgct catcattcct tgagaaaaac aatgagctga gaggcagact tccctgaatg
2160

tattgaactt ggaaagaaat gcccatctat gtcccttgct gtgagcaaga agtcaaagta
2220

aaacttgctg cctgaagaac agtaactgcc atcaagatga gagaactgga ggagttcctt
2280

gatctgtata tacaataaca taatttgtac atatgtaaaa taaaattatg ccatagcaag
2340

attgcttaaa atagcaacac tctatattta gattgttaaa ataactagtg ttgcttgga
2400

tattataatt taatgcatgt taggaaaatt tcacattaat atttgctgac agctgacctt
2460

tgtcatcttt cttctatctt attccctttc acaaaatttt attcctatat agtttattga
2520

caataatttc aggttttgta aagatgccgg gttttatatt tttatagaca aataataagc
2580

aaaggaggca ctgggttgac tttcaggtac taaatacctc aacctatggt ataatggttg
2640

actgggtttc tctgtatagt actggcatgg tacggagatg tttcacgaag tttgttcac
2700

agactcctgt gcaactttcc caatgtggcc taaaaatgca acttcttttt attttctttt
2760

gtaaatgttt aggttttttt gtatagtaaa gtgataattt ctggaattaa aaa
2813

<210> 92

<211> 647

<212> PRT

<213> Homo sapiens

<400> 92

Met Pro Gly Lys Met Val Val Ile Leu Gly Ala Ser Asn Ile Leu Trp
1 5 10 15

Ile Met Phe Ala Ala Ser Gln Ala Phe Lys Ile Glu Thr Thr Pro Glu
20 25 30

Ser Arg Tyr Leu Ala Gln Ile Gly Asp Ser Val Ser Leu Thr Cys Ser
 35 40 45

Thr Thr Gly Cys Glu Ser Pro Phe Phe Ser Trp Arg Thr Gln Ile Asp
 50 55 60

Ser Pro Leu Asn Gly Lys Val Thr Asn Glu Gly Thr Thr Ser Thr Leu
 65 70 75 80

Thr Met Asn Pro Val Ser Phe Gly Asn Glu His Ser Tyr Leu Cys Thr
 85 90 95

Ala Thr Cys Glu Ser Arg Lys Leu Glu Lys Gly Ile Gln Val Glu Ile
 100 105 110

Tyr Ser Phe Pro Lys Asp Pro Glu Ile His Leu Ser Gly Pro Leu Glu
 115 120 125

Ala Gly Lys Pro Ile Thr Val Lys Cys Ser Val Ala Asp Val Tyr Pro
 130 135 140

Phe Asp Arg Leu Glu Ile Asp Leu Leu Lys Gly Asp His Leu Met Lys
 145 150 155 160

Ser Gln Glu Phe Leu Glu Asp Ala Asp Arg Lys Ser Leu Glu Thr Lys
 165 170 175

Ser Leu Glu Val Thr Phe Thr Pro Val Ile Glu Asp Ile Gly Lys Val
 180 185 190

Leu Val Cys Arg Ala Lys Leu His Ile Asp Glu Met Asp Ser Val Pro
 195 200 205

Thr Val Arg Gln Ala Val Lys Glu Leu Gln Val Tyr Ile Ser Pro Lys
 210 215 220

Asn Thr Val Ile Ser Val Asn Pro Ser Thr Lys Leu Gln Glu Gly Gly
 225 230 235 240

Ser Val Thr Met Thr Cys Ser Ser Glu Gly Leu Pro Ala Pro Glu Ile
 245 250 255

Phe Trp Ser Lys Lys Leu Asp Asn Gly Asn Leu Gln His Leu Ser Gly
 260 265 270

Asn Ala Thr Leu Thr Leu Ile Ala Met Arg Met Glu Asp Ser Gly Ile
 275 280 285

Tyr Val Cys Glu Gly Val Asn Leu Ile Gly Lys Asn Arg Lys Glu Val
 290 295 300

Glu Leu Ile Val Gln Ala Phe Pro Arg Asp Pro Glu Ile Glu Met Ser
 305 310 315 320

Gly Gly Leu Val Asn Gly Ser Ser Val Thr Val Ser Cys Lys Val Pro
 325 330 335

Ser Val Tyr Pro Leu Asp Arg Leu Glu Ile Glu Leu Leu Lys Gly Glu
 340 345 350

Thr Ile Leu Glu Asn Ile Glu Phe Leu Glu Asp Thr Asp Met Lys Ser
 355 360 365

Leu Glu Asn Lys Ser Leu Glu Met Thr Phe Ile Pro Thr Ile Glu Asp
 370 375 380

Thr Gly Lys Ala Leu Val Cys Gln Ala Lys Leu His Ile Asp Asp Met
 385 390 395 400

Glu Phe Glu Pro Lys Gln Arg Gln Ser Thr Gln Thr Leu Tyr Val Asn
 405 410 415

Val Ala Pro Arg Asp Thr Thr Val Leu Val Ser Pro Ser Ser Ile Leu
 420 425 430

Glu Glu Gly Ser Ser Val Asn Met Thr Cys Leu Ser Gln Gly Phe Pro
 435 440 445

Ala Pro Lys Ile Leu Trp Ser Arg Gln Leu Pro Asn Gly Glu Leu Gln
 450 455 460

Pro Leu Ser Glu Asn Ala Thr Leu Thr Leu Ile Ser Thr Lys Met Glu
 465 470 475 480

Asp Ser Gly Val Tyr Leu Cys Glu Gly Ile Asn Gln Ala Gly Arg Ser
 485 490 495

Arg Lys Glu Val Glu Leu Ile Ile Gln Val Thr Pro Lys Asp Ile Lys
 500 505 510

Leu Thr Ala Phe Pro Ser Glu Ser Val Lys Glu Gly Asp Thr Val Ile
 515 520 525

Ile Ser Cys Thr Cys Gly Asn Val Pro Glu Thr Trp Ile Ile Leu Lys
 530 535 540

Lys Lys Ala Glu Thr Gly Asp Thr Val Leu Lys Ser Ile Asp Gly Ala
 545 550 555 560

Tyr Thr Ile Arg Lys Ala Gln Leu Lys Asp Ala Gly Val Tyr Glu Cys
 565 570 575

Glu Ser Lys Asn Lys Val Gly Ser Gln Leu Arg Ser Leu Thr Leu Asp
 580 585 590

Val Gln Gly Arg Glu Asn Asn Lys Asp Tyr Phe Ser Pro Glu Leu Leu
 595 600 605

Val Leu Tyr Phe Ala Ser Ser Leu Ile Ile Pro Ala Ile Gly Met Ile
 610 615 620

Ile Tyr Phe Ala Arg Lys Ala Asn Met Lys Gly Ser Tyr Ser Leu Val
 625 630 635 640

Glu Ala Gln Lys Ser Lys Val
 645